MASTER

XLII

The apparent influence of 1ft. earth monthly mean temperatures on subsequent monthly mean air temperatures at Southport

The mean monthly air temperatures and 0900h. earth temperatures at a depth of 1ft were available for Hesketh Park, Southport for the 40 years, 1892-1931.

For simplicity, the 1ft. earth temperatures were divided such that 50% were termed 'warm' and 50% 'cool'. The air temperatures were divided similarly and the possible influence of earth temperatures on the mean air temperature of the following month was examined with the following results:-

Months with 'warm' earth temperatures	Air temperature of following month	
	'warm'	'cool'
January	10	10
February	13	7
March	14	6
April	10	10
May	14	6
June	11	9
July	12	8
August	12	8
September	12	8
October	9	11
November	8	12
December	8	12

From this it is seen that March, April and June have tended to be warm if the earth temperatures of the previous month were warm. If the earth temperatures in late summer (July, August and September) are warm then there was a 3:2 chance of the following month's air temperatures also being warm, but this persistence is not so apparent for the rest of the year, and there is a tendency towards a reverse effect in late autumn.

Months with 'cool' earth temperatures	Air temperature of following month	
	'warm'	'cool'
January	10	10
February	7	13
March	6	14
April	10	10
May	6	14
June	9	11
July	8	12
August	8	12
September	8	12
October	11	9
November	12	8
December	12	8

This table is the reverse of the previous picture and shows the same evidence of skew distribution. The March and May distributions are significant at the 2 per cent level.

Conclusion

It appears that the 1ft. earth temperatures in February, March and May are likely to be followed by air temperatures in the following month with a deviation from median values in the same sense (warm or cold), but this effect is absent following January and April and appears to be reversed in October, November and December.

Agricultural Memorandum No. XLII
Bracknell
November 1961

M. Roulston
L. P. Smith